

## Cordell Bank NMS Program Areas Matrix

CORDELL BANK NATIONAL MARINE SANCTUARY				
Issue	Education & Outreach	Research & Monitoring	Resource Management/Policy	Notes
<p><b><u>Administration</u></b></p> <ul style="list-style-type: none"> <li>Build solid and independent infrastructure including staff, facilities, and budget</li> <li>Coordinate with other two sanctuaries on improved management and operational efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Develop visitor space at offices</li> </ul>	<ul style="list-style-type: none"> <li>Hire research coordinator, oceanographer (c)</li> <li>Obtain adequate research equipment</li> <li>Continue to participate in research workshop jointly with GF (c)</li> <li>Develop cross-site standardized protocols for monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Separate from GFNMS and acquire sanctuary manager</li> <li>Hire GIS specialist</li> <li>Increase staffing to support program development</li> <li>Main office should be in Bodega Bay</li> <li>Increase budget to increase program development</li> <li>Continue developing SAC's advisory role in resource management issues</li> </ul>	

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<p><b><u>Ecosystem Protection</u></b></p> <ul style="list-style-type: none"> <li>• Characterize the sanctuary ecosystem through species and habitat inventory</li> <li>• Evaluate significance of Bodega Canyon and its contribution to the productivity of CBNMS</li> <li>• Develop a plan to address new and emerging issues</li> <li>• Maintain long-term monitoring program</li> <li>• Direct research effort to help protect biodiversity and provide support for making resource management decisions</li> <li>• Protect rocky habitats through addressing impacts from fishing and anchoring</li> <li>• Address impacts from fishing activities</li> </ul>	<ul style="list-style-type: none"> <li>• Develop exhibits and signs on CB (and GF) as feeding ground for resident and migratory species using existing space at Pt. Reyes and California Academy of Sciences. Also other feasible visitor centers interpreting the marine environments (c)</li> <li>• Expand and focus lecture series to include biodiversity protection topics</li> <li>• Make better use of media as outreach tool (invite media onto research vessels/ DELTA to show them what the Sanctuary does to protect biodiversity)</li> <li>• Series of articles in local newspapers</li> <li>• Compile living journal of sanctuary researchers on website</li> <li>• Hold joint education/ research symposium every other year jointly with Gulf of Farallones (c)</li> <li>• Continue participation in</li> </ul>	<ul style="list-style-type: none"> <li>• Expand Ecosystem Dynamics Study (EDS) to year-round: assessment of physical and biological features of the Cordell Bank ecosystem, with emphasis on distribution and abundance of krill, marine mammals, and seabirds, investigate relative abundance of key species (c)</li> <li>• Build on Cordell Bank site characterization program, include: habitat characterization, species inventory (c)</li> <li>• Update 1980s GIS database with data on bathymetry, sediments, seabird and marine mammals of CB and GF (Bonnell and Ford, early 1990s) (c)</li> <li>• Determine if the resources of Bodega Canyon would benefit from protection through being designated part of the Sanctuary</li> <li>• Complete development of Bio-Acoustic studies to</li> </ul>	<ul style="list-style-type: none"> <li>• Need inventory of human uses of the Sanctuary</li> <li>• Evaluate sanctuary's role in the development of reserves in Sanctuary waters (c)</li> <li>• Develop policy on sanctuaries' role in fisheries management based on biodiversity and ecosystem protection and communicate to the public</li> <li>• Establish seabed disturbance prohibition</li> <li>• Propose wildlife disturbance regulation (specifically to address issues such as shark chumming)</li> <li>• Obtain adequate research equipment</li> <li>• Conduct baseline natural resource inventory for damage assessment following spills</li> </ul>	

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<b><u>Ecosystem Protection</u></b> <b><u>(Continued)</u></b>	<p>West Coast Student Monitoring Network (minigrant). Develop classroom monitoring kit including measures for biodiversity, satellite imagery and ROV footage (c)</p> <ul style="list-style-type: none"> <li>• Expand Teacher at Sea program</li> <li>• Continue student summit with GFNMS (c)</li> <li>• Develop highschool curriculum with biodiversity protection concepts, integrate CB into GF's Coastal Ecosystem Program (c)</li> <li>• Initiate Sea Watch- a boater-based "eyes and ears of the sanctuary" program designed after Beach Watch. Employ volunteer recreational boaters, fishermen, and charter boaters to monitor marine debris, water quality, human use activities, marine mammal and seabird sightings (c)</li> </ul>	<p>estimate distribution, abundance, and biomass of zooplankton (c)</p> <ul style="list-style-type: none"> <li>• Work with scientific community to encourage research in the Sanctuary that addresses resource management issues</li> <li>• CB should provide support for seabird colonies aerial surveys (c)</li> <li>• Work with other west coast sanctuaries to develop regional monitoring program similar to EDS and integrate EDS into National Monitoring Program</li> </ul>		

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<b><u>Fishing Activities</u></b> <ul style="list-style-type: none"> <li>Define Sanctuaries' role in fisheries management</li> <li>Impacts from krill harvesting to biomass, primary productivity, and trophic disruptions</li> <li>Benthic habitat impacts from fishing gear</li> <li>Evaluate sanctuaries' need for marine reserves</li> </ul>	<ul style="list-style-type: none"> <li>Get involved with Sustainable Seafood Coalition. It educates public and industry on sustainable fishing practices (c)</li> </ul>	<ul style="list-style-type: none"> <li>Expand use of ROVs to visually assess gear presence in Sanctuary habitats (part of habitat characterization)</li> <li>Work cooperatively with NMFS where possible on determining key species</li> <li>Standardize ROV and DELTA protocols between sanctuaries and enter data into GIS</li> </ul>	<ul style="list-style-type: none"> <li>Work closely with commercial and sport fishermen to evaluate fishery issues as they arise (PCFFA, IFR)</li> <li>Develop policy on sanctuaries' role in fisheries management based on biodiversity and ecosystem protection</li> </ul>	
<b><u>Partnerships with Community Groups</u></b> <ul style="list-style-type: none"> <li>Identify and build community partners</li> <li>Create a friends group</li> </ul>			<ul style="list-style-type: none"> <li>Develop friends group</li> <li>Develop SAC Participation</li> <li>Identify and develop community partners</li> <li>Develop a community action plan</li> </ul>	

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<p><b><u>Research</u></b></p> <ul style="list-style-type: none"> <li>• Continue site focus on research</li> <li>• Improve understanding of the Sanctuary ecosystem</li> <li>• Collect data that addresses specific management issues</li> <li>• Coordinate efforts between research institutions</li> <li>• Disseminate research information to the public</li> </ul>	<ul style="list-style-type: none"> <li>• Continue bi-annual research workshop w/ GF; CB take a more active role presenting its research (c)</li> <li>• Hold annual Student Summit (c)</li> <li>• Use multimedia (web, video, sound), lectures, media releases to disseminate research results/activities to the public</li> <li>• Develop research internship program(s) with local research institutions</li> <li>• Continue on-going Teacher-at-Sea Program (c)</li> <li>• Use research results in education programs</li> <li>• Develop Web-based education using live uplinks and video/ satellite imagery</li> <li>• Workshop for BML student applicants on Sanctuary permits and what the permit process entails (c)</li> </ul>	<ul style="list-style-type: none"> <li>• Support expansion of CODAR system around Gulf (radar system mapping surface currents) (partner with OSPR, BML)</li> <li>• Acquire data from graduate student larval recruitment studies work at BML</li> <li>• Continue vessel support for Scripps Institute of Oceanography Current Profiler Buoy in CBNMS</li> <li>• Expand EDS to year round: Ecosystem Dynamics Study (EDS): assessment of physical and biological features of the Cordell Bank ecosystem (c)</li> <li>• Build on Cordell Bank site characterization program. (c)</li> </ul>	<ul style="list-style-type: none"> <li>• Manage CBNMS with an emphasis on research</li> <li>• Continue working relationships with academic institutions to encourage research in the Sanctuary</li> <li>• Request data sets from all researchers and permittees to provide additional data resources for use in management decision making</li> </ul>	

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<p><b><u>Water Quality</u></b></p> <ul style="list-style-type: none"> <li>• Establish baseline data</li> <li>• Develop long-term water quality monitoring</li> <li>• Maintain high level of water quality in CBNMS</li> </ul>	<ul style="list-style-type: none"> <li>• Outreach to commercial and recreational boaters to encourage cleaner boating practices through a program similar to “Dock Walkers” (Save our Shores, CA Coastal Commission)</li> <li>• Develop classroom- based student water quality monitoring program using remote sensing technologies and collected samples</li> </ul>	<ul style="list-style-type: none"> <li>• Test water column and key benthic species for non-point source pollution (hydrocarbons, organic and trace metals)</li> <li>• Develop detailed understanding of water currents and circulatory patterns around pinnacles (c)</li> </ul>	<ul style="list-style-type: none"> <li>• Enforce discharge regulation</li> <li>• Prohibition on oil and gas development</li> </ul>	

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